

WHAT IS CLAIMED IS:

1. Composite particles having an average particle diameter of 0.001 to 10.0 μm , comprising:
 - white inorganic particles as core particles;
 - a gluing agent coating layer formed on surface of said white inorganic particle; and
 - an organic pigment coat formed onto said gluing agent coating layer in an amount of from 1 to 500 parts by weight based on 100 parts by weight of said white inorganic particles.
2. Composite particles according to claim 1, wherein said gluing agent is an organosilicon compound, a coupling agent, an oligomer compound or a polymer compound.
3. Composite particles according to claim 2, wherein said organosilicon compound is at least one organosilicon compound selected from the group consisting of:
 - (1) organosilane compounds obtainable from alkoxysilane compounds,
 - (2) polysiloxanes or modified polysiloxanes, and
 - (3) fluoroalkyl organosilane compounds obtainable from fluoroalkylsilane compounds.
4. Composite particles according to claim 2, wherein said coupling agent is at least one selected from the group consisting of a silane-based coupling agent, a titanate-based

0940336-032001

coupling agent, an aluminate-based coupling agent and a zirconate-based coupling agent.

5. Composite particles according to claim 1, wherein said white inorganic particles are a white pigment, a pearl pigment or an extender pigment.

6. Composite particles according to claim 1, wherein said white inorganic particles as core particles are particles each having on at least a part of the surface thereof, a coating layer comprising at least one compound selected from the group consisting of hydroxides of aluminum, oxides of aluminum, hydroxides of silicon and oxides of silicon.

7. Composite particles according to claim 1, wherein said organic pigment is an organic red-based pigment, an organic blue-based pigment, an organic yellow-based pigment or an organic green-based pigment.

8. Composite particles according to claim 1, wherein said composite particles have a BET specific surface area value of 1.0 to 500 m²/g.

9. Composite particles according to claim 1, wherein said composite particles have a tinting strength of not less than 110%, and a light resistance (ΔE^* value) of not more than 5.0.

00000000-000001

10. Composite particles according to claim 1, wherein the amount of said organic pigment coat formed onto said gluing agent coating layer is from 1 to 300 parts by weight based on 100 parts by weight of said white inorganic particles.

11. Composite particles according to claim 1, wherein the amount of the gluing agent coating layer comprising the organosilicon compound or the silane-based coupling agent is 0.02 to 5.0% by weight, calculated as Si, based on the weight of the gluing agent-coated white inorganic particles, and the amount of the gluing agent coating layer comprising the titanate-based coupling agent, the aluminate-based coupling agent, the zirconate-based coupling agent, the oligomer or the polymer compound is 0.01 to 15.0% by weight, calculated as C, based on the weight of the gluing agent-coated white inorganic particles.

12. Composite particles having an average particle diameter of 0.001 to 10.0 μm , comprising:

white inorganic particles as core particles;

a gluing agent coating layer formed on surface of said white inorganic particle, comprising at least one selected from the group consisting of a silane-based coupling agent, a titanate-based coupling agent, an aluminate-based coupling agent, a zirconate-based coupling agent, an oligomer compound,

a polymer compound and an organosilicon compound selected from the group consisting of:

(1) organosilane compounds obtainable from alkoxysilane compounds,

(2) polysiloxanes or modified polysiloxanes, and

(3) fluoroalkyl organosilane compounds obtainable from fluoroalkylsilane compounds; and

an organic pigment coat formed on said coating layer in an amount of from 1 to 500 parts by weight based on 100 parts by weight of said white inorganic particles.

13. Composite particles according to claim 12, wherein said white inorganic particles are a white pigment, a pearl pigment or an extender pigment.

14. Composite particles according to claim 12, wherein said white inorganic particles as core particles are particles each having on at least a part of the surface thereof, a coating layer comprising at least one compound selected from the group consisting of hydroxides of aluminum, oxides of aluminum, hydroxides of silicon and oxides of silicon.

15. Composite particles according to claim 12, wherein said organic pigment is an organic red-based pigment, an organic blue-based pigment, an organic yellow-based pigment or an organic green-based pigment.

03940856, 032901
106230, 9330455

16. Composite particles according to claim 12, wherein the amount of said organic pigment coat formed onto said gluing agent coating layer is from 1 to 300 parts by weight based on 100 parts by weight of said white inorganic particles.

17. Composite particles according to claim 12, wherein the amount of the gluing agent coating layer comprising the organosilicon compound or the silane-based coupling agent is 0.02 to 5.0% by weight, calculated as Si, based on the weight of the gluing agent-coated white inorganic particles, and the amount of the gluing agent coating layer comprising the titanate-based coupling agent, the aluminate-based coupling agent, the zirconate-based coupling agent, the oligomer compound or the polymer compound is 0.01 to 15.0% by weight, calculated as C, based on the weight of the gluing agent-coated white inorganic particles.

18. Composite particles according to claim 12, wherein said composite particles have a BET specific surface area value of 1.0 to 500 m²/g.

19. Composite particles according to claim 12, wherein said composite particles have a tinting strength of not less than 110%, and a light resistance (ΔE^* value) of not more than 5.0.

00940855-002001

20. Composite particles having an average particle diameter of 0.001 to 10.0 μm , comprising:

white inorganic particles as core particles;

a coating layer formed on surface of said white inorganic particle, comprising at least one organosilicon compound selected from the group consisting of:

(1) organosilane compounds obtainable from alkoxyasilane compounds, and

(2) polysiloxanes or modified polysiloxanes; and
an organic pigment coat formed on the coating layer comprising said organosilicon compound in an amount of from 1 to 100 parts by weight based on 100 parts by weight of said white inorganic particles.

21. Composite particles according to claim 20, wherein said white inorganic particles as core particles are particles each having on at least a part of the surface thereof, a coating layer comprising at least one compound selected from the group consisting of hydroxides of aluminum, oxides of aluminum, hydroxides of silicon and oxides of silicon.

22. Composite particles according to claim 20, wherein said organic pigment is an organic red-based pigment, an organic blue-based pigment, an organic yellow-based pigment or an organic green-based pigment.

09440865-002201

23. Composite particles according to claim 20, wherein the amount of the coating layer comprising said organosilicon compound is 0.02 to 5.0% by weight, calculated as Si, based on the weight of the coated white inorganic particles.

24. Composite particles according to claim 20, wherein said composite particles have a BET specific surface area value of 1.0 to 500 m²/g.

25. Composite particles according to claim 20, wherein said composite particles have a tinting strength of not less than 115%, and a light resistance (ΔE^* value) of not more than 5.0.

26. Composite particles having an average particle diameter of 0.001 to 10.0 μ m, comprising:

white inorganic particles as core particles;

a gluing agent coating layer formed on surface of said white inorganic particle; and

at least two colored adhesion layers composed of an organic pigment, formed on said coating layer through a gluing agent,

the amount of the organic pigment being 1 to 500 parts by weight based on 100 parts by weight of said white inorganic particles.

0940856-082901

27. Composite particles according to claim 26, wherein said gluing agent is an organosilicon compound, a coupling agent, an oligomer compound or a polymer compound.

28. Composite particles according to claim 27, wherein said organosilicon compound is at least one organosilicon compound selected from the group consisting of:

- (1) organosilane compounds obtainable from alkoxysilane compounds,
- (2) polysiloxanes or modified polysiloxanes, and
- (3) fluoroalkyl organosilane compounds obtainable from fluoroalkylsilane compounds.

29. Composite particles according to claim 27, wherein said coupling agent is at least one selected from the group consisting of a silane-based coupling agent, a titanate-based coupling agent, an aluminate-based coupling agent and a zirconate-based coupling agent.

30. Composite particles according to claim 26, wherein said white inorganic particles are a white pigment, a pearl pigment or an extender pigment.

31. Composite particles according to claim 26, wherein said white inorganic particles as core particles are particles each having on at least a part of the surface thereof, a

03940825-002901

coating layer comprising at least one compound selected from the group consisting of hydroxides of aluminum, oxides of aluminum, hydroxides of silicon and oxides of silicon.

32. Composite particles according to claim 26, wherein said organic pigment is an organic red-based pigment, an organic blue-based pigment, an organic yellow-based pigment or an organic green-based pigment.

33. Composite particles according to claim 26, wherein said composite particles have a BET specific surface area value of 1.0 to 500 m²/g.

34. Composite particles according to claim 26, wherein said composite particles have a tinting strength of not less than 110%, and a light resistance (ΔE^* value) of not more than 5.0.

35. Composite particles according to claim 26, wherein the amount of said organic pigment coat formed onto said gluing agent coating layer is from 1 to 300 parts by weight based on 100 parts by weight of said white inorganic particles.

36. Composite particles according to claim 26, wherein the amount of the gluing agent coating layer comprising the organosilicon compound or the silane-based coupling agent is

0340885-002901

0.02 to 5.0% by weight, calculated as Si, based on the weight of the gluing agent-coated white inorganic particles, and the amount of the gluing agent coating layer comprising the titanate-based coupling agent, the aluminate-based coupling agent, the zirconate-based coupling agent, the oligomer compound or the polymer compound is 0.01 to 15.0% by weight, calculated as C, based on the weight of the gluing agent-coated white inorganic particles.

37. Composite particles having an average particle diameter of 0.001 to 10.0 μm , comprising:

white inorganic particles as core particles;

a gluing agent coating layer formed on surface of said white inorganic particle, comprising at least one selected from the group consisting of a silane-based coupling agent, a titanate-based coupling agent, an aluminate-based coupling agent, a zirconate-based coupling agent, an oligomer compound, a polymer compound and an organosilicon compound selected from the group consisting of:

(1) organosilane compounds obtainable from alkoxysilane compounds,

(2) polysiloxanes or modified polysiloxanes, and

(3) fluoroalkyl organosilane compounds obtainable from fluoroalkylsilane compounds; and

at least two colored adhesion layers composed of an organic pigment, formed on said coating layer through a gluing

agent comprising at least one selected from the group consisting of a silane-based coupling agent, a titanate-based coupling agent, an aluminate-based coupling agent, a zirconate-based coupling agent, an oligomer compound, a polymer compound and an organosilicon compound selected from the group consisting of: (1) organosilane compounds obtainable from alkoxysilane compounds, (2) polysiloxanes or modified polysiloxanes, and (3) fluoroalkyl organosilane compounds obtainable from fluoroalkylsilane compounds,

the amount of the organic pigment being 1 to 500 parts by weight based on 100 parts by weight of said white inorganic particles.

38. Composite particles according to claim 37, wherein said white inorganic particles are particles each having on at least a part of the surface thereof, a coating layer comprising at least one compound selected from the group consisting of hydroxides of aluminum, oxides of aluminum, hydroxides of silicon and oxides of silicon.

39. Composite particles according to claim 37, wherein said organic pigment is an organic red-based pigment, an organic blue-based pigment, an organic yellow-based pigment or an organic green-based pigment.

40. Composite particles according to claim 37, wherein

the amount of the gluing agent coating layer comprising the organosilicon compound or the silane-based coupling agent is 0.02 to 5.0% by weight, calculated as Si, based on the weight of the gluing agent-coated white inorganic particles, and the amount of the gluing agent coating layer comprising the titanate-based coupling agent, the aluminate-based coupling agent, the zirconate-based coupling agent, the oligomer compound or the polymer compound is 0.01 to 15.0% by weight, calculated as C, based on the weight of the gluing agent-coated white inorganic particles.

41. Composite particles according to claim 37, wherein the amount of said organic pigment coat formed onto said gluing agent coating layer is from 1 to 300 parts by weight based on 100 parts by weight of said white inorganic particles.

42. Composite particles according to claim 37, wherein said composite particles have a BET specific surface area value of 1.0 to 500 m²/g.

43. Composite particles according to claim 37, wherein said composite particles have a tinting strength of not less than 115%, and a light resistance (ΔE^* value) of not more than 5.0.

44. Composite particles having an average particle

diameter of 0.001 to 0.5 μm , comprising:

extender pigment particles as core particles;

a gluing agent coating layer formed on surface of said extender pigment particle, comprising an organosilicon compound, a coupling agent, an oligomer compound or a polymer compound; and

an organic pigment coat formed on the gluing agent coating layer in an amount of from 1 to 500 parts by weight based on 100 parts by weight of said extender pigment particles.

45. Composite particles according to claim 44, wherein the average particle diameter thereof is 0.001 to 0.3 μm .

46. Composite particles according to claim 44, wherein said extender pigment particles as core particles are particles each having on at least a part of the surface thereof, a coating layer comprising at least one compound selected from the group consisting of hydroxides of aluminum, oxides of aluminum, hydroxides of silicon and oxides of silicon.

47. Composite particles according to claim 44, wherein said organic pigment is an organic red-based pigment, an organic blue-based pigment, an organic yellow-based pigment or an organic green-based pigment.

00440866-00001

48. Composite particles according to claim 44, wherein the amount of the gluing agent coating layer comprising the organosilicon compound or the silane-based coupling agent is 0.02 to 5.0% by weight, calculated as Si, based on the weight of the gluing agent-coated extender pigment particles, and the amount of the gluing agent coating layer comprising the titanate-based coupling agent, the aluminate-based coupling agent, the zirconate-based coupling agent, the oligomer compound or the polymer compound is 0.01 to 15.0% by weight, calculated as C, based on the weight of the gluing agent-coated extender pigment particles.

49. Composite particles according to claim 44, wherein the amount of said organic pigment coat formed onto said gluing agent coating layer is from 1 to 300 parts by weight based on 100 parts by weight of said extender pigment.

50. Composite particles according to claim 44, wherein said composite particles have a BET specific surface area value of 1.0 to 500 m²/g.

51. Composite particles according to claim 44, wherein said composite particles have a tinting strength of not less than 115%, and a light resistance (ΔE^* value) of not more than

5.0.

52. A process for producing composite particles as defined in claim 1, comprising:

mixing white inorganic particles with a gluing agent under stirring to form a gluing agent coating layer on surface of said white inorganic particle; and

mixing an organic pigment with the gluing agent-coated white inorganic particles under stirring to form an organic pigment coat on the gluing agent coating layer.

53. A pigment comprising the composite particles defined in any one of claims 1, 12, 20, 26, 37 and 44.

54. A paint comprising:

said pigment defined in claim 53; and a paint base material.

55. A paint according to claim 54, wherein the amount of said pigment is 0.5 to 100 parts by weight based on 100 parts by weight of said paint base material.

56. A rubber or resin composition comprising:

said pigment defined in claim 53; and

a base material for rubber or resin composition.

0940866-032001

57. A rubber or resin composition according to claim 56, wherein the amount of said pigment is 0.05 to 200 parts by weight based on 100 parts by weight of said base material for rubber or resin composition.

58. A pigment dispersion for solvent-based paint comprising:

100 parts by weight of a pigment dispersion base material for solvent-based paint; and

5 to 1,000 parts by weight of the pigment defined in claim 53.

59. A pigment dispersion for water-based paint comprising:

100 parts by weight of a pigment dispersion base material for water-based paint; and

5 to 1,000 parts by weight of the pigment defined in claim 53.

60. Master batch pellets comprising:

100 parts by weight of rubber or thermoplastic resins; and

1 to 100 parts by weight of the pigment defined in claim 53.

03940866-082901